ENVIRONMENTAL ASSESSMENT NATIONAL DEVELOPMENT PLAN OF RIVER BASINS FROM ROMANIA

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ABSTRACT

Environmental assessment is an integral part of the procedure for the adaptation of plans and programs. In the field of water management the Directory Scheme of River Basins Management and Development is a planning instrument in the water field on river basin. It has two components: the River Basin Development Plan and the River Basin Management Plan.
The current development plans, including the national plan, were elaborated on the basis of substantiation studies, elaborated by numerous institutions in the field, studies to which NIHWM participated not only as developer, but also as coordinator.
In the environmental assessment of NDPRB, the plan objectives contribute to achieving environmental objectives relevant to consider the potential significant environmental effects if the plan was implemented or not. Strategic environmental assessment involve the analysis plan objectives from the perspective of potential conflicts that may arise in achieving them. From the perspective of the strategic environmental assessment of NDPRB there is identified mainly the opportunity of promoted measures according to the magnitude and reversibility of environmental effects, with emphasis on consideration of national security perspective to ensure water demand and general aspect of the geographic location for the establishments.

Keywords: environmental assessment, Directory Scheme of River Basins Management and Development, National Development Plan of River Basin.

INTRODUCTION

The concerns for environment have increased in recent years due to the mutual influence of national and international legislation. Prevention mechanisms are the main focus. Some of these mechanisms include the strategic environmental assessment. Directive 2001/42/EC of the European Parliament and of the Council which refers to assessment of effects of certain plans and programs on the environment (SEA Directive) entered into force on 21 July 2001. This Directive requires public authorities to consider if the plans or programs that prepare them meet the scope of this Directive and, so, if is necessary to achieve an environmental assessment of the proposals in accordance with the procedures of the Directive.

Environmental assessment for plans and programs has the aim to provide a high level of environmental protection and contribute to the integration of environmental considerations into the preparation and adoption of certain plans and programs to promote sustainable development by conducting an environmental assessment of plans and programs that may have significant environment.

CASE STUDY- ENVIRONMENT ASSESSMENT NATIONAL DEVELOPMENT PLAN OF RIVER BASIN FROM ROMANIA

Implementation in Romania of the concept of sustainable development in the water sector is achieved through the Directory Scheme of River Basins Management and Development. It is provided in the Water Law. 107/1996 with subsequent amendments as a planning tool that sets basic guidelines towards sustainable management, unified, balanced and complex water resources and aquatic ecosystems, and to protect wetlands and reducing the negative effects of excess water or the lack of it. The Directory Scheme has two components: the River Basin Development Plan, component of water resources quantitative management and the River Basin Management Plan, component of water qualitative management.
The purpose of the National Development Plan for River Basins is to determine the actions, measures, options, solutions and works for: achieving and maintaining the balance between water requirements and availability of resources;mitigation of negative effects of natural phenomenon on life, goods, human activities and of environment; the use of water potential and determining the environment requirements on water resources; water management in terms of climate change.
NDPRB addresses only the quantitative aspects of water management as a critical resource for sustaining life and socio-economic development, the frame content based on the provisions set out in Annex 2 to the Ministerial Order no. 1258/2006.
Management plan is based on:assessment of resources and socio-economic resources of surface water and groundwater,the way in which water resources are used at present, planning objectives in managing water resources contained in the National Strategy for Sustainable Development of Romania, in sectoral development strategies and plans, in development programs, in the Sectoral Operational Programme Environment, in National Rural Development Programme, on Energy Strategy of Romania.

ASSESSMENT METHODOLOGY

Strategic Environmental Assessment for PNABH was done by following the steps set by GD 1076/2004, namely:

a) the stage of framing the plan or program in environmental assessment procedure-plan;
b) the stage of completion of the draft plan or program and achieving the environmental report;
c) phase quality analysis of the environmental report.

Depending on the stage of the SEA was chosen for combining of following methods descriptive, analytical and interactive:

- Consultation (Working Group) in the scoping stage;
- Establishing Indicators and consultation (Working Group) for stage monitoring;
- Multi-criteria analysis and consultation (working group and public consultation).

In the stage of framing the plan holder notify the competent authority (Ministry of Environment and Climate Change/ National Administration for Environmental Protection/ AEP/ for environmental protection and public information) to start the process of drafting the plan. Announcement is published twice every 3 days. For 15 days the public can transmit comments and suggestions to the environmental authority. Within 25 days of the first publication of the environmental authority must issue a decision or submission to the SEA procedure. The public may appeal the decision disposing screening stage 10 calendar days from the date of publication. In case of comments / reviews / appeals, they should be solved within 15 days of the expiry of 10 days. Within 3 days of the final decision, it is brought to the public by posting on the Internet by the environmental authority and published in the media by the holder.

Stage of completion of the draft plan or program and achieving the environmental report consists of:

- Establishment Working Group
- Availability of the draft plan or program and the environmental report completion, this stage has two major objectives:finalizing the draft plan / program; developing environmental report.

The environmental assessment is conducted during the preparation of the plan / program before its adoption or submission for approval / adoption, and ends with the environmental report.
The working group is made up of representatives from several institutions.
In accordance with Article 14 of the GD 1076/2004, the Working Group were analyzed to assess the possibilities NDPRB on the scope and level of detail to be included in the environmental report.
In the environmental assessment the analyze of the way in which plan's objectives contribute to achieving environmental objectives relevant consider the potential significant environmental effects if without implementation of the plan or its implementation.
Environmental report identifies, describes and evaluates the potential significant environmental effects of implementing the plan or program and its reasonable alternatives taking into account the objectives and the geographical area of the plan or program.

The objectives of National Development Plan of River Basins are:
O1. Inventory of surface water resources and groundwater (natural);
O2. Determining of the current situation of using the use of water resources;
O3. Identify existing structural developments to ensure availability at sources and key performance parameters;

O4. Establishing the future socio-economic and environment requirements concerning for water resources;
O5. The identification of feasible options for achieving balance between the availability of water sources and land use requirements;
O6. Preliminary assessment of potential flood risk on the river basin;
O7. Identification of actions, measures, solutions and works for:
O7.1. Achieving acceptable level of flood protection of human and property;
O7.2. Mitigating the effects of drought, aridity trends, excess moisture and soil erosion;
O7.3. Using water potential;
O7.4. Satisfying environmental demands on water resources (requirements hydrological, hydraulic and ecological);
O.8. Identification of the constraints, conflicts of interest and the solutions;
O.9. Impact analysis and risk assessment induced by the actions, measures, solutions and works proposed in the management plan.

All nine main objectives is addressed to each of the four targets objectives proposed for socio-economic sectors, who is constituted as users of main water uses.

1. The targets objectives in the field of population access to drinking water infrastructure;
2. The targets objectives in the field of industrial water;
3. The targets objectives in agriculture (irrigation, livestock and aquaculture);
4. The targets objectives in the potential of the use of water:
    - The use of hydropower potential.
    - The use of navigable potential.

Table 1 *The result for the compatibility assessment exercise NDPRB objectives*

	O1	**O2**	**O3**	**O4**	**O5**	**O6**	**O7.1**	**O7.2**	**O7.3**	**O7.4**	**O8**	**O9**
O1		+	+	+	+	+	+	+	+	+	+	+
O2	0		+	+	+	+	+	+	+	+	+	+
O3	0	+		+	+	+	+	+	+	+	+	+
O4	0	0	+		+	+	+	+	+	+	+	+
O5	0	+	+	+		+	+	+	+	+	+	+
O6	0	+	0	0	+		+	+	+	+	+	+
O7.1	0	0	0	0	+	0		+	+	+	+	+
O7.2	0	0	0	+	+	0	0		+	+	+	+
O7.3	0	+	+	+	+	0	+	0		+	+	+
O7.4	0	0	0	+	+	0	+	+	+		+	+
O8	0	+	+	+	+	+	+	+	+	+		+
O9	0	+	0	+	+	0	+	+	+	+	+	

Legend: + the objective express a potentiating effect on other goals, 0 are not influential, - the objective manifests limiting or negative effect on other objectives an limiting or negative effect on other objectives.

In table. 1 is presented the result for the compatibility assessment exercise NDPRB objectives, effect of mutual potentiating objectives in the rate of 76.5%

and the lack of influence in 23.5%. Analysis of current state of the environment was made for each relevant environmental issue selected in the working group discussions.
Relevant environmental aspects are: air, water, soil, climate change, biodiversity, population and human health, material assets, natural landscape, cultural heritage, increase awareness of environmental issues. The conception NDPRB has included the items specific to each river basin and connecting them to the overall scheme for a global analysis of the way forward, the area likely to be affected is represented by the entire national territory.
The alternative without implementation of NDPRB involve the lack of coordination of specific investments in water management and increasing pressure by abandoning and / or stagnation of development projects for the following sectors:

- Population – water supplying;
- Agriculture – zootechnics water / combat drought;
- Energy – use the potential energy;
- Transport – use the potential navigable.

The indicator of exploiting these use is represented by water requirement. For to assess the effects of alternative PNABH without implementation of was conceived a scoring system applicable to specific plan proposals presented in the table 2. This assessment allows the visualization of the size of impact, with relative objectivity, but by means of measurable comparable characteristics and, unlike qualitative observations purely subjective.

Table 2 *Scoring system applicable to specific plan proposals*

Characteristics effects	**Score(+ positive/ - negative)**			
	1	**2**	**3**	**4**
Probability of event	Null	Accidental or rare	Frequently	Permanent
Impact area (water body and area affected)	Water sector	Full water body	Water Basin	Transboundary effects
Magnitude	Affected territories	Material goods / assets affected	Biodiversity	Persons affected
Potential compensation	Integral	Partial	Surrogate	Null
Reversibility	Momentary	Short term	Long term	Irreversible

Scoring is done by adding the scores assigned for each characteristic of examined effect. The system was simplified to meet the accessibility requirements of the message SEA documents, but reflects correct the result more accurately of the application of algebraic combinations of scores.
Minimal negative score is -20, positive maximum score is 20, with crossing point through 0 in the absence of manifestation of the effect, case false because it indicates a flawed selection the consequences without implementation of the plan.

Table 3 presents the results of applying the scoring system. It may be noted that the non-implementation by analyzing test scores NDPRB has significant negative consequences by degrading existing liabilities or aggravation of environmental problems currently showing.

***Table 3** The results of applying the scoring system*

Environmental aspects relevant	Possible evolution without implementation of the NDPRB	Score
Wayer	- The failure of investments for the rehabilitation, expansion and development of water supply networks and lack of investment in industry and agriculture will lead to difficulties in attaining quality of life and balanced management of water resources. - Anthropogenic influence in the hydro-morphology of the surface water bodies without proper planning and a detailed analysis will lead to changes in morphology and hydrologic regime with direct impact on maintaining the ecological functions of water. - Abandoning the execution submersible entry threshold Bala arm of the Danube, in the kilometer 345 on the river, will continue and will increase the atrophy process of Old Danube. - The failure of investments for new investments in inland waterways on rivers.	-13 -18 -19 +7
Air	- The lack of investments in hydro / micro hydropower can record trends for increasing the use of combustion plants and that the concentrations of acidifying air pollutants and eutrophication. - The failure of investments for arranging on inland rivers waterways tablets replacing other means of transportation (especially for goods) which have a higher emission levels.	-14 -13
Soil	- The development and the operation of certain types of investments in uncontrolled manner and without an adequate monitoring can lead to soil salinization effects. - Chronicization and expansion of high drought risk areas and even desertification (eg extended surfaces of the Romanian Plain, Dobrogea and partially in Western Plain) in the absence of measures to combat drought.	-17 -15
Climate change	- The lack of a coordinated national planning which takes into account the influence of climate change on the dynamics of water resources (Correlation of rivers flow from low-flow drought / flood-flow rates with effluent treatment plants) can generate negative effect on downstream water uses, and wildlife habitats. (eg in river-flow Correlation of low flows in drought / flood-flow rates with effluent treatment plants) can generate negative effect on downstream water uses, and wildlife habitats.	-19
Biodiversity	- Random development projects that include water abstraction and small unplanned development can significantly affect habitats of conservation interest and protected areas. - Restricting of investments necessary for the exploitation of the hydropower potential in favor of using water for energy production based on conventional fuels leads to global impacts caused by GHG emissions being affected uncontrollable diversity and wider coverage biodiversity protection areas.	-18 -20
Population and human health	- The failure of investments for the rehabilitation, expansion and development of the water supply network will still exhibit a significant part of the population from diseases due to water contamination and provide the necessary water. - Abandonment of the execution submersible entry threshold Bala arm of the Danube can put under risk insurance on the Old Danube flows and levels between Bala and Cernavoda-Harsova required in shallow water navigation on the Danube, as well as cooling water for nuclear power plant at Cernavoda NPP units . - Achievement the fragment of investments necessary to flood protection measures can put at risk population of unprotected areas.	-15 -16 -17
Protecting and preserving historical heritage	- The lack of complete investigation and consideration of historic heritage issues in development projects. - Degradation of surface water quality can have a significant impact on water-related customs and traditions, especially in areas where these events can be exploited for tourism.	-15 -15
Increased awareness of environmental issues	- The lack of information programs and public awareness and lack involvement in decision-making will be the population to represent a factor of pressure on the environment	-18

The relevant national main objectives of PNABH medium are:

1. Maintaining air quality in zones and agglomerations who falls into the specified by regulations for quality indicators.

2. Improving air quality in zones and agglomerations where the limit values do not fit the rules in force for quality indicators.

3. Adoption of measures necessary in order to limit up to elimination of negative effects, including in a transboundary context.

4. Achieving a sustainable water management policies by ensuring water quality and quantity protection, defense against the destructive actions of water and turning water potential in relation to sustainable development requirements of the society and in accordance with European directives-actualization.

5. Restoration ecological / renaturation of rivers.

6. Ensuring the quality of water intended for human consumption.

7. The protection of soil on the basis of the principles of land conservation functions, prevent soil degradation and integration with other sectoral policies.

8. Reducing the risk of floods and droughts.

9. Using water potential.

10. Ensuring the commitments undertaken by Romania in the UNFCCC and the Kyoto Protocol and to the obligations assumed by integrating climate change in the European Union.

11. Elaborating and implementing of voluntary objectives of Romania on adaptation to climate change impacts.

12. Conservation of natural habitats and of wild flora and fauna.

13. Conservation and increasing biodiversity by reducing negative impacts and by the ecological reconstruction of damaged ecosystems and habitats.

14. Environmental improvement so that it does not become a risk factor for human health, the development of indicators that could reflect the state of human health and of the environment.

15. Flood protection of existing economic infrastructure and ensuring of economic opportunities of future generations to meet.

16. The location of new landfills an inflooded areas or provides significant flood areas, subject to all other restrictions and criteria for establishing the site.

17. Protection and enhancement of natural landscape with conservation of aesthetic aspect.

18. Protection and conservation in situ of monuments and property historic, keeping of local traditions and customs.

19. The active involvement of communities in decision-making.

In table 4 is presented the compatibility of the objectives PNABH (O) and major national environmental objectives relevant to PNABH (OPR).

Table 4 *The compatibility of the objectives PNABH (O) and major national environmental objectives relevant to PNABH (OPR).*

	O1	O2	O3	O4	O5	O6	O7.1	O7.2	O7.3	O7.4	O8	O9
OPR1	0	0	0	+	+	0	0	0	+	+	+	+
OPR2	0	0	0	+	+	0	0	0	+	+	+	+
OPR3	0	+	+	+	+	+	+	0	+	+	+	+
OPR4	+	+	+	+	+	+	+	+	+	+	+	+
OPR5	+	+	+	+	+	+	+	+	-	+	+	+
OPR6	+	+	+	+	+	+	+	+	0	+	+	+
OPR7	+	+	+	+	+	0	0	+	0	+	+	+
OPR8	+	+	+	+	+	+	+	+	+	+	+	+
OPR9	+	+	+	+	+	+	+	0	+	+	+	+
OPR10	+	+	+	+	+	0	0	0	+	+	+	+
OPR11	+	+	+	+	+	+	+	+	+	+	+	+
OPR12	+	+	+	+	+	+	+	+	-	+	+	+
OPR13	+	+	+	+	+	+	+	+	-	+	+	+
OPR14	+	+	+	+	+	+	+	+	+	+	+	+
OPR15	+	+	+	+	+	+	+	+	+	+	+	+
OR16	+	0	0	0	+	+	+	0	0	+	+	+
OR17	+	+	+	+	+	+	+	+	-	+	+	+
OR18	+	+	+	+	+	+	+	+	-	+	+	+
OR19	+	+	+	+	+	+	+	+	0	+	+	+

It is important to highlight the difference between the approach of identifying and evaluating the environmental effects of NDPRB / development plans of each river basin and evaluate the effects on each proposed project:
- From the perspective of the strategic environmental assessment of PNABH is identified the opportunity of promoted measures depending on the magnitude and reversibility of environmental effects, with particular focus on consideration of national security perspective to ensure water demand and general geographic location conditioning aspect decorations.
- From the perspective of environmental impact assessment every project will be analyzed from the point of view of the potential environmental impact both from terms of geographic area optimal location / hydrological identified at the national and district planning pool and the concrete measures required to reduce or eliminate potential pollution in exploitation by contractors.
The conclusions of the analysis justified the acceptance of the plain, as single alternative, but like options were analyzed the scenarios presented by NDPRB. Proposed measures must to support the water demand forecast for scenarios considered for the years 2013, 2015, 2020. The analysis indicates the Medium scenario for 2020 as scenario with the highest potential for achieving the objectives PNABH followed by medium scenario for 2015. Is considered the medium scenario for 2015 like deployment scenario, taking into account the objectives associated through PNMBD to achieve good water status.
The purpose of the analysis stage of quality report and decision making states is to ensure the elaboration of an environmental report complete with information that shows confidence and that achieves the objectives of a government decision. After completion of the environmental report, within 5

days the environmental competent authority, the competent authority for health and other authorities concerned should receive the draft plan / program and the environmental report. The competent authority for health and other authorities concerned the effects of implementing the plan or program, are obliged within 45 calendar days from the receipt the draft plan or program and the environmental report to prepare and submit in writing to the competent authority for environment a detailed and motivated viewpoint on the draft proposed plan or program and the environmental report. At 45 days after the deadline is organized the public debate of proposed draft plan or program and the environmental report. In 15 calendar days of public debate, environmental authorities made aware of the holder in writing, the decision to issue the environmental permit, which is made public by posting on its website within 3 days from taking them.

CONCLUSIONS

The environmental effects can be caused by the actions and works identified under objective 7 (identifying actions, measures, solutions and works).
It was found that the areas affected are health and public safety, air quality, surface water resources and groundwater, soil, biodiversity, material assets, traditions and historical values, natural landscape and climate change.
The conclusions of the analysis show that implementation of the Plan has positive effects on the health and safety of populations by ensuring access to water resources and by protection against floods, the air quality, by potential for energy in a way cleaner and possibility (limited) a less polluting transport mode on soil-through access to the source of water for irrigation and flood protection in terms of climate change.
It is noted negative effects on water and landscape, biological diversity (fish, animals, vegetation) in technical terms as changes in hydrological parameters of population conservation areas / habitats of plant and animal populations, altered bio circuits natural-geo-chemical essential for maintaining the ecological functions of rivers and riparian systems.
The negative effects can not be completely eliminate, but to reduce the negative effects, the plan proposes administrative, legal, and technical measures that must be applied. It is follows the implementation of the plan so that minimize the negative effects on water and biodiversity.

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